

# BS in Computer Engineering (393540) MAP Sheet

Engineering, Electrical and Computer Engineering

For students entering the degree program during the 2019-2020 curricular year.



University Core and Graduation Requirements	Suggested Sequence of Courses	
<b>University Core Requirements:</b>		
<b>Requirements</b>	<b>#Classes</b>	<b>Hours</b>
<b>Religion Cornerstones</b>	<b>Classes</b>	
Teachings and Doctrine of The Book of Mormon	1	2.0
Jesus Christ and the Everlasting Gospel	1	2.0
Foundations of the Restoration	1	2.0
The Eternal Family	1	2.0
<b>The Individual and Society</b>		
American Heritage	1-2	3-6.0
Global and Cultural Awareness	1	3.0
<b>Skills</b>		
First Year Writing	1	3.0
Advanced Written and Oral Communications	1	3.0
Quantitative Reasoning	1	4.0
Languages of Learning (Math or Language)	1	4.0
<b>Arts, Letters, and Sciences</b>		
Civilization 1	1	3.0
Civilization 2	1	3.0
Arts	1	3.0
Letters	1	3.0
Biological Science	1	3-4.0
Physical Science	1	3.0
Social Science	1	3.0
<b>Core Enrichment: Electives</b>		
Religion Electives	3-4	6.0
Open Electives	Variable	Variable
<p>FOR UNIVERSITY CORE QUESTIONS CONTACT THE ADVISEMENT CENTER # FOR PROGRAM QUESTIONS SEE YOUR DEPARTMENT ADVISOR</p> <p>*THESE COURSES FILL BOTH UNIVERSITY CORE AND PROGRAM REQUIREMENTS (16-17 hours overlap)</p> <p>‡REDUCTION OF TOTAL CREDITS IS RECOMMENDED by choosing a Civilization 2 course that also double counts for the Arts requirement (if a separate Letters course is taken) or the Letters requirement (if a separate Arts course is taken). GCA might also double count with one of several University Core requirements. See the University Core list for specifics (core.byu.edu).</p>		
<b>Graduation Requirements:</b>		
Minimum residence hours required		30.0
Minimum hours needed to graduate		120.0
<b>Suggested Sequence of Courses</b>		
<b>FRESHMAN YEAR</b>		
<u>1st Semester</u>		
EC EN 191	0.5	
First-year Writing or American Heritage	3.0	
C S 142	3.0	
CHEM 105	4.0	
MATH 112	4.0	
Religion Cornerstone course	2.0	
<b>Total Hours</b>	<b>16.5</b>	
<u>2nd Semester</u>		
First-year Writing or American Heritage	3.0	
MATH 113	4.0	
PHSCS 121	3.0	
C S 235	3.0	
Religion Cornerstone course	2.0	
<b>Total Hours</b>	<b>15.0</b>	
<b>SOPHOMORE YEAR</b>		
<u>3rd Semester</u>		
C S 236	3.0	
EC EN 220	3.0	
MATH 313	3.0	
PHSCS 220	3.0	
University Core requirement	3.0	
Religion Cornerstone course	2.0	
<b>Total Hours</b>	<b>17.0</b>	
<u>4th Semester</u>		
C S 240	4.0	
EC EN 240	4.0	
MATH 334	3.0	
University Core requirement	3.0	
Religion elective	2.0	
<b>Total Hours</b>	<b>16.0</b>	
<b>JUNIOR YEAR</b>		
<u>5th Semester</u>		
EC EN 330	4.0	
EC EN 340	4.0	
EC EN 391	0.5	
EC EN 380	4.0	
Religion Cornerstone course	2.0	
<b>Total Hours</b>	<b>14.5</b>	
<u>6th Semester</u>		
EC EN 323	4.0	
STAT 201	3.0	
EC EN 390	3.0	
University Core requirement	3.0	
Religion elective	2.0	
<b>Total Hours</b>	<b>15.0</b>	
<b>SENIOR YEAR</b>		
<u>7th Semester</u>		
EC EN 475	3.0	
Technical elective	4.0	
Technical elective	3.0	
University Core requirement	3.0	
University Core requirement	3.0	
<b>Total Hours</b>	<b>16.0</b>	
<u>8th Semester</u>		
EC EN 476	3.0	
Technical elective	4.0	
Technical elective	3.0	
ENGL 312 or 316	3.0	
Religion elective	2.0	
<b>Total Hours</b>	<b>15.0</b>	
<p>*Actual course sequences should be adapted to individual needs. For example, students with AP credits in Math, Physics, or Computer Science will already have credit for some initial courses. Many students find it beneficial to attend one or more spring or summer terms. On average, students take about nine semesters to graduate in this program.</p> <p>The student advisor in the department can assist you in choosing electives to meet your total hour requirement.</p> <p>Note: Students are encouraged to complete an average of 16 credit hours each semester or 32 credit hours each year, which could include spring and/or summer terms. Taking fewer credits substantially increases the cost and the number of semesters to graduate.</p>		

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### 2019-2020 Program Requirements (90 Credit Hours)

<p><b>REQUIREMENT 1</b> Complete 21 courses</p> <p>C S 142 - Introduction to Computer Programming 3.0</p> <p>C S 235 - Data Structures and Algorithms 3.0</p> <p>C S 236 - Discrete Structures 3.0</p> <p>C S 240 - Advanced Programming Concepts 4.0</p> <p>EC EN 191 - New Student Seminar 0.5</p> <p>EC EN 220 - Fundamentals of Digital Systems 3.0</p> <p>EC EN 240 - Circuit Analysis and Laboratory 4.0</p> <p>EC EN 323 - Computer Organization 4.0</p> <p>EC EN 330 - Introduction to Embedded System Programming 4.0</p> <p>EC EN 340 - Electronic Circuit Design 1 4.0</p> <p>EC EN 380 - Signals and Systems 4.0</p> <p>EC EN 390 - Junior Team Design Project 3.0</p> <p>EC EN 391 - Junior Seminar 0.5</p> <p>EC EN 475 - Capstone Design 1 3.0</p> <p>EC EN 476 - Capstone Design 2 3.0</p> <p>MATH 112 - Calculus 1 4.0</p> <p>MATH 113 - Calculus 2 4.0</p> <p>MATH 334 - Ordinary Differential Equations 3.0</p> <p>PHSCS 121 - Introduction to Newtonian Mechanics 3.0</p> <p>PHSCS 220 - Introduction to Electricity and Magnetism 3.0</p> <p>STAT 201 - Statistics for Engineers and Scientists 3.0</p> <p><b>REQUIREMENT 2</b> Complete 1 option</p> <p><b>OPTION 2.1</b> Complete 1 course</p> <p>MATH 313 - (Not currently offered)</p> <p><b>OPTION 2.2</b> Complete 2 courses</p> <p>MATH 213 - Elementary Linear Algebra 2.0</p> <p>MATH 215 - Computational Linear Algebra 1.0</p> <p><b>REQUIREMENT 3</b> Complete 2 options</p> <p><b>OPTION 3.1</b> Complete 1 course</p> <p>CHEM 105 - General College Chemistry 1 with Lab (Integrated) 4.0</p> <p>CHEM 111 - Principles of Chemistry 1 4.0</p> <p><b>OPTION 3.2</b> Complete 1 course</p> <p><b>NOTE: WRTG 312 RECOMMENDED.</b></p> <p>WRTG 312 - (Not currently offered)</p> <p>WRTG 316 - (Not currently offered)</p> <p><b>Complete at least 14 credit hours of TECHNICAL ELECTIVES from the following two requirements.</b></p> <p><b>REQUIREMENT 4</b> Complete 8.0 hours from the following course(s)</p> <p><b>TECHNICAL ELECTIVES:</b></p>	<p>EC EN 424 - Computer Systems 4.0</p> <p>EC EN 425 - Real-Time Operating Systems 4.0</p> <p>EC EN 427 - Embedded Systems 4.0</p> <p><b>REQUIREMENT 5</b> Complete 6.0 hours from the following course(s)</p> <p><b>TECHNICAL ELECTIVES. (NOTE: EC EN COURSES WILL NOT DOUBLE COUNT.)</b></p> <p><b>OTHER COURSES MAY BE APPROVED BY THE DEPARTMENT.</b></p> <p>C S 340 - Software Design and Testing 3.0</p> <p>C S 345 - Operating Systems Design 3.0</p> <p>C S 360 - (Not currently offered)</p> <p>C S 428 - Software Engineering 3.0</p> <p>C S 431 - Algorithmic Languages and Compilers 3.0</p> <p>C S 452 - Database Modeling Concepts 3.0</p> <p>C S 455 - Computer Graphics 3.0</p> <p>C S 456 - Introduction to User Interface Software 3.0</p> <p>C S 460 - Computer Communications and Networking 3.0</p> <p>C S 462 - Large-Scale Distributed System Design 3.0</p> <p>C S 465 - Computer Security 3.0</p> <p>C S 470 - Introduction to Artificial Intelligence 3.0</p> <p>C S 472 - Introduction to Machine Learning 3.0</p> <p>C S 484 - (Not currently offered)</p> <p>EC EN 360 - Electromagnetic Fields and Waves 4.0</p> <p>EC EN 424 - Computer Systems 4.0</p> <p>EC EN 425 - Real-Time Operating Systems 4.0</p> <p>EC EN 427 - Embedded Systems 4.0</p> <p>EC EN 445 - Introduction to Mixed-Signal VLSI 4.0</p> <p>EC EN 446 - Power Electronics 4.0</p> <p>EC EN 450 - Introduction to Semiconductor Devices 3.0</p> <p>EC EN 452 - Experiments in Integrated Circuit Development 1.0</p> <p>EC EN 462 - Electromagnetic Radiation and Propagation 2.0</p> <p>EC EN 464 - Wireless Communication Circuits 2.0</p> <p>EC EN 466 - Introduction to Optical Engineering 2.0</p> <p>EC EN 483 - (EC En-Me En 431) Design of Control Systems 4.0</p> <p>EC EN 485 - Introduction to Digital Communication Theory 4.0</p> <p>EC EN 487 - Introduction to Discrete-Time Signal Processing 4.0</p> <p>MATH 314 - Calculus of Several Variables 3.0</p> <p><b>REQUIREMENT 6</b></p> <p>Complete the department exit survey and interview.</p>	<p><b>THE DISCIPLINE:</b></p> <p>Electrical and Computer Engineering is one of the most exciting, diverse, and forward-looking disciplines offered at the university. Contemporary society is in the midst of an information revolution, created in large part from the fruits of electrical and computer engineering. Electrical and computer engineers have been primary contributors to the astonishing developments in communication, computer, and network technology. They have designed devices and systems that have a significant impact on manufacturing, medicine, transportation, and environmental monitoring. Smart phones, tablets, digital cameras, high definition television, solar power, microprocessors, lasers, unmanned air vehicles, medical imaging systems, and autonomous robotic systems are all examples of devices and systems designed by electrical and computer engineers.</p> <p>Innovations that flow out of electrical and computer engineering sustain the national economy and improve the quality of life for people throughout the world. In the future, society will look to electrical and computer engineers to address grand challenges ranging from sustainable and efficient energy to health care technologies and global communications networks.</p> <p>The Department of Electrical and Computer Engineering at Brigham Young University offers accredited degrees in Electrical Engineering and Computer Engineering.</p> <p>Electrical Engineering focuses on microelectronics, electromagnetics, electronic circuits, wireless communications, signal processing, biomedical applications, photonics, and controls. Computer Engineering focuses on the design of digital computing devices and systems and involves hardware and software, operating systems, digital logic, real-time systems, and computer vision. Both programs combine fundamental principles with hands-on learning, including an innovative Junior Core experience that integrates classroom knowledge with project-based learning.</p> <p><b>CAREERS:</b></p> <p>Electrical and computer engineers are among the most actively recruited students graduating from a four-year program. Baccalaureate engineers typically start their careers as members of project teams with one or more of the following responsibilities: designing digital, analog, or opto-electronic circuits; creating or testing applicationspecific software; testing components or systems; or providing technical support for sales. Later on, many engineers find themselves pursuing managerial careers, starting their own companies, or even managing entrepreneurial funds. Top graduates are also well received by medical schools, law schools, and professional and</p>
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2019-2020

programs.

The Computer Engineering baccalaureate program is accredited by the Engineering Accreditation Commission of ABET, Inc., <http://www.abet.org>.

### **INTERNSHIPS, CO-OP ED, PRACTICAL EXPERIENCE:**

Optional co-op and internship experiences with engineering firms throughout the USA are available.

These experiences may extend over one semester plus the spring/summer terms, for a total of eight months.

### **PROFESSIONAL AND HONOR SOCIETIES:**

The student chapter of the Institute of Electrical and Electronic Engineers is the professional organization;

Eta Kappa Nu is the electrical and computer engineering honor society; and Tau Beta Pi is the honor society for all engineering fields.

### **MAP DISCLAIMER**

While every reasonable effort is made to ensure accuracy, there are some student populations that could have exceptions to listed requirements. Please refer to the university catalog and your college advisement center/department for complete guidelines.

### **DEPARTMENT INFORMATION**

#### **Electrical and Computer Engineering Department**

Brigham Young University  
460/450 Engineering Building  
Provo, UT 84602  
Telephone: 801-422-4012

### **ADVISEMENT CENTER INFORMATION**

#### **Engineering Advisement Center**

Brigham Young University  
246 Engineering Building

Provo, UT 84602

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